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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

INZIRILLO, GIOACCHINO

ART UNIT PAPER NUMBER

2828

DATE MAILED: 04/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/267,362

Applicant(s)

NITTA, JUN

Examiner

Gioacchino Inzirillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. US 5,541,945 (herein after known as Yamaguchi) in view of Hiroki et al. US 5,757,840 (herein after known as Hiroki) and Okuda US 5,802,096 (herein after known as Okuda). Fig. 4 of Yamaguchi shows a good example of a prior art DFB laser. The three regions are labeled as the active region, phase control region and the DBR region. Independent electrodes control a) the pumping of the active region, and b) the injection into the phase controlling region. As can be seen from the figure, this is an edge emitting semiconductor device and has cleaved edges, which can have reflective coatings. Turning to Fig. 2 of Hiroki, we see a DFB laser where the DBR and the active region are further integrated by overlaying the active layer 32 and the guide layer 31 directly over the grating 21. Incorporating the Hiroki improvement into the Yamaguchi invention leads to two possibilities. The first possibility is to place the phase control region between the first and second regions as Hiroki himself did in Fig. 8 of his patent. The second possibility is to place the phase control region at the end of one of the grating DBR regions as in the Instant Invention. The first possibility would allow for the coupling coefficients between

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each of the first and second gain regions and the phase control region to be the same due to the symmetry of the device. The second possibility would necessarily need there to be a difference in the coupling coefficients, and one of ordinary skill would be able to determine the most efficient way to do that would be to have the coefficient lower between the phase control region and the region immediately adjacent to it. The only way to do this is to have an amplitude change somewhere between facet and the phase control region, while maintaining the pitches the same. This would allow for the grating to interact with the light in the same manner, while changing the coupling coefficient. An example of this can be seen in Okuda, Fig. 15. Therefore, it would be obvious to one of ordinary skill in the art to modify Yamaguchi as taught by Hiroki and Okuda. In addition, the changing the current limitation of claim 19 is inherent; that is the way this device works. In addition, a control means is also inherent since something must be doing the changing of the current.

Claims 20 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Hiroki and Okuda as applied to claims 10 – 19 above, and further in view of Uchida US 5,757,832 (herein after known as Uchida). Yamaguchi in view of Hiroki and Okuda fails to teach a mode selector for selecting a component of a desired mode from the light output. However, Uchida teaches such a device in column 4 lines 13 – 22. ~~Therein he also teaches receiver for~~ receiving the output. Such transmitters and receivers are well known and are used, for example, in WDM communications systems where a need exists for a plurality of intensity-modulated signals at a plurality of wavelengths. Therefore, it would be obvious to one of ordinary skill in the art to modify Yamaguchi in view of Hiroki and Okuda as taught by Uchida for selecting a

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predetermined polarization mode component of an output, and having a receiver for receiving the transmission signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gioacchino Inzirillo whose telephone number is 703-305-1967. The examiner can normally be reached on M-F 8:30AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on 703-308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Gioacchino Inzirillo
Examiner
Art Unit 2828

April 8, 2002


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